

### CLAIMS

Please amend the Claims as follows:

1. (Currently Amended) A method of efficiently storing an effective address (EA) used by a thread in an Effective to Real Address Translation (ERAT) table, in a main processing unit (MPU) having two or more threads, the method comprising the steps of:

defining a plurality of first thread valid indicators for each thread in the MPU;

storing an EA using one ERAT table entry;~~and~~

setting a plurality of second thread valid indicators in the ERAT table entry for each thread using the EA to refer to the same RA[.];

determining whether a received EA for a first thread matches an ERAT table entry;

upon determining that the received EA matches an ERAT table entry, determining whether the matching entry is marked valid for the first thread;

upon determining that the matching entry is marked valid for the first thread,

looking up the corresponding RA in the data array table and outputting the RA;

upon determining that the matching entry is not marked valid for the first thread but is marked valid for other threads, determining whether the information in the matching entry is correct for the first thread;

upon determining that the information in the matching entry is correct for the first thread, setting a valid indicator marking the entry as valid for the first thread; and

upon determining that the information in the matching entry is not correct for the first thread, or that the EA does not match any ERAT table entry, writing a new ERAT table entry for the EA and marking it valid for the first thread.

2. (Currently Amended) The method of Claim 1, further comprising translating the received effective address (EA) to a real address (RA) using anthe Effective to Real Address Translation (ERAT) table.

3. (Cancelled)

4. (Currently Amended) The method of Claim 1[[3]], wherein when writing a new ERAT table entry for the received EA, the entry's thread valid indicators are set to show the entry is valid for all threads using the received EA to refer to the RA.
5. (Original) The method of Claim 1, further comprising invalidating the EA entry in the ERAT table.
6. (Original) The method of Claim 5, further comprising:  
determining the threads for which the EA entry is no longer valid; and  
setting the thread valid indicators, for those threads for which the EA entry is no longer valid, to invalid in the EA entry.
7. (Cancelled)
8. (Currently Amended) The method of Claim 1[[7]], further comprising:  
~~presenting the EA used by the thread;~~  
~~determining upon a determination~~ that the received EA does not match any entry in the ERAT table[[:]]:  
retrieving an RA for the received EA using a secondary translation;  
writing a new entry containing the received EA; and  
setting the entry's thread valid indicator to show the received EA entry is valid for the first thread.
9. (Original) The method of Claim 8, wherein the entry's thread valid indicators are set to show the entry is valid for all threads using the EA to refer to the RA.
10. (Currently Amended) An apparatus for efficiently storing an effective address (EA) used by a thread in an Effective to Real Address Translation (ERAT) table, in a main processing unit (MPU) having two or more threads, the apparatus comprising:  
means for defining a plurality of first thread valid indicators for each thread in the MPU;

means for storing an EA using one ERAT table entry;~~and~~  
means for setting a plurality of second thread valid indicators in the ERAT table entry for each thread using the EA to refer to the same RA[[]];  
means for determining whether a received EA for a first thread matches an ERAT table entry;  
means for upon determining that the received EA matches an ERAT table entry, determining whether the matching entry is marked valid for the first thread;  
means for upon determining that the matching entry is marked valid for the first thread, looking up the corresponding RA in the data array table and outputting the RA;  
means for upon determining that the matching entry is not marked valid for the first thread but is marked valid for other threads, determining whether the information in the matching entry is correct for the first thread;  
means for upon determining that the information in the matching entry is correct for the first thread, setting a valid indicator marking the entry as valid for the first thread; and  
means for upon determining that the information in the matching entry is not correct for the first thread, or that the EA does not match any ERAT table entry, writing a new ERAT table entry for the EA and marking it valid for the first thread.

11. (Currently Amended) The apparatus of Claim 10, further comprising translating the received EA to an RA using [[an]]the ERAT table.

12. (Cancelled)

13. (Currently Amended) The apparatus of Claim 10[[12]], wherein when writing a new ERAT table entry for the received EA, the entry's thread valid indicators are set to show the entry is valid for all threads using the received EA to refer to the RA.

14. (Currently Amended) The apparatus of Claim 10, further comprising means for invalidating the received EA entry in the ERAT table.
15. (Original) The apparatus of Claim 14, further comprising:  
means for determining the threads for which the EA entry is no longer valid; and  
means for setting the thread valid indicators, for those threads for which the EA entry is no longer valid, to invalid in the EA entry.
16. (Cancelled)
17. (Currently Amended) The apparatus of Claim 16, further comprising:  
~~means for presenting the EA used by the thread;~~  
means for determining that the received EA does not match any entry in the ERAT table;  
means for retrieving an RA for the received EA using a secondary translation;  
means for writing a new entry containing the received EA; and  
means for setting the entry's thread valid indicator to show the received EA entry is valid for the first thread.
18. (Original) The apparatus of Claim 17, wherein the entry's thread valid indicators are set to show the entry is valid for all threads using the EA to refer to the RA.
19. (Currently Amended) A computer program product for efficiently storing an effective address (EA) used by a thread in an Effective to Real Address Translation (ERAT) table, in a main processing unit (MPU) having two or more threads, the computer program product having a medium with a computer program embodied thereon, the computer program comprising:  
computer program code for defining a plurality of first thread valid indicators for each thread in the MPU;  
computer program code for storing an EA using one ERAT table entry;~~and~~  
computer program code for setting a plurality of second thread valid indicators in the ERAT table entry for each thread using the EA to refer to the same RA[.];

computer program code for determining whether a received EA for a first thread matches an ERAT table entry;

computer program code for upon determining that the received EA matches an ERAT table entry, determining whether the matching entry is marked valid for the first thread;

computer program code for upon determining that the matching entry is marked valid for the first thread, looking up the corresponding RA in the data array table and outputting the RA;

computer program code for upon determining that the matching entry is not marked valid for the first thread but is marked valid for other threads, determining whether the information in the matching entry is correct for the first thread;

computer program code for upon determining that the information in the matching entry is correct for the first thread, setting a valid indicator marking the entry as valid for the first thread; and

computer program code for upon determining that the information in the matching entry is not correct for the first thread, or that the EA does not match any ERAT table entry, writing a new ERAT table entry for the EA and marking it valid for the first thread.

20. (Currently Amended) The computer program product of Claim 19, further comprising translating the received EA to an RA using ~~[[an]]~~the ERAT table.

21. (Cancelled)

22. (Currently Amended) The computer program product of Claim 19~~[[21]]~~, wherein when writing a new ERAT table entry for the received EA, the entry's thread valid indicators are set to show the entry is valid for all threads using the received EA to refer to the RA.

23. (Original) The computer program product of Claim 19, further comprising invalidating the EA entry in the ERAT table.

24. (Original) The computer program product of Claim 23, further comprising:  
computer program code for determining the threads for which the EA entry is no longer valid; and  
computer program code for setting the thread valid indicators, for those threads for which the EA entry is no longer valid, to invalid in the EA entry.
25. (Cancelled)
26. (Currently Amended) The computer program product of Claim 19[[25]], further comprising:  
~~computer program code for presenting the EA used by the thread;~~  
computer program code for determining that the received EA does not match any entry in the ERAT table;  
computer program code for retrieving an RA for the received EA using a secondary translation;  
computer program code for writing a new entry containing the received EA; and  
computer program code for setting the entry's thread valid indicator to show the received EA entry is valid for the first thread.
27. (Original) The computer program product of Claim 26, wherein the entry's thread valid indicators are set to show the entry is valid for all threads using the EA to refer to the RA.